

## Vectors for Expressing Telomerase Reverse Transcriptase in Mammalian Cells

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### Claims

1. A recombinant expression vector containing a polynucleotide that comprises an encoding region for a telomerase reverse transcriptase protein, variant, or fragment, wherein the protein, variant or fragment has telomerase catalytic activity when complexed with a telomerase RNA, and wherein a single-stranded DNA consisting of said encoding region hybridizes to a second single-stranded DNA at 5°C to 25°C below  $T_m$  in aqueous solution at 1 M NaCl, wherein said second DNA is exactly complementary to SEQ. ID NO:224, and  $T_m$  is the melting temperature under the same reaction conditions of double-stranded DNA having the sequence of SEQ. ID NO:224.
2. The expression vector of claim 1, further comprising a promoter, an enhancer, or a 3' untranslated region.
3. The expression vector of claim 1, selected from a recombinant bacteriophage, a plasmid, a cosmid, a yeast expression vector, and a viral expression vector.
4. The expression vector of claim 1, selected from a mammalian virus expression vector, an SV40 virus expression vector, an EBV expression vector, an *Autographa californica* nuclear polyhedrosis virus expression vector, an adenovirus expression vector, a retrovirus expression vector, a herpes virus expression vector, and a vaccinia virus expression vector.
5. The expression vector of claim 2, wherein the promoter is a constitutive promoter.
6. The expression vector of claim 2, wherein the promoter is an inducible promoter.
7. The expression vector of claim 2, wherein the promoter is selected from an alpha factor promoter, an alcohol oxidase promoter, a PGH promoter, a 35S promoter of CaMV, a 19S promoter of CaMV, a lacZ promoter, a p-lac hybrid promoter, a polyhedrin promoter, a heat shock promoter, a RUBISCO promoter, and a storage protein gene promoter.]
8. The expression vector of claim 1, further comprising a viral origin of replication.
9. The expression vector of claim 1, further comprising a selectable marker gene.
10. The expression vector of claim 9, wherein the selectable marker gene is selected from herpes simplex virus thymidine kinase, adenine phosphoribosyltransferase, *dhfr*, *npt*, *als*, *pat*, *trpB*, *hisD*, anthocyanin,  $\beta$  glucuronidase, and luciferase.
11. A host cell comprising the expression vector of claim 1.
12. A host cell comprising the expression vector of claim 2.

13. A host cell comprising the expression vector of claim 3.
14. A host cell comprising the expression vector of claim 4.
15. An expression vector containing a polynucleotide that comprises an encoding region for a polypeptide containing SEQ. ID NO:225, or fragment thereof that has telomerase catalytic activity when complexed with a telomerase RNA.
16. The expression vector of claim 15, which is an adenovirus expression vector, a retrovirus expression vector, a herpes virus expression vector, or a vaccinia virus expression vector.
17. The expression vector of claim 15, further comprising a constitutive or inducible promoter operably linked to the encoding region.
18. The expression vector of claim 15, which causes expression of telomerase reverse transcriptase in mammalian cells.
19. The expression vector of claim 15, in a composition that comprises a pharmaceutically acceptable carrier.
20. A host cell comprising the expression vector of claim 15.